

some cases this will not be until the observers return home.

Rough prints from several of the negatives obtained with the prismatic cameras used by Sir Norman Lockyer's party show as great amount of detail as those taken in

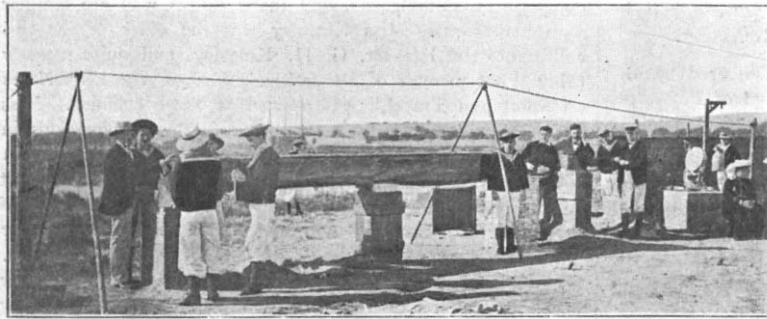


FIG. 1.—Two of the cameras fed by a coelostat.

1898. From a cursory examination of the negatives few differences appear in the chromospheric spectrum; the "1474" corona ring seems, however, slightly more feeble than before.



FIG. 2.—The 20-foot prismatic camera and siderostat.

In a letter received from Mr. Fowler he states that the negatives obtained by Mr. Payn with the 16-foot Cooke coronagraph are excellent, especially one showing the inner corona.

The accompanying illustrations, received too late for reproduction with Sir Norman Lockyer's letter last week, show some of the arrangements made for observing the eclipse at Santa Pola. Particulars concerning the various instruments will be found in NATURE of May 17.

Prof. H. H. Turner, at Bonsarea, near Algiers, successfully carried out his programme of photographing the corona, obtaining seven ordinary pictures and seven with interposed polarising apparatus. The polarisation indicated was decidedly radial.

Mr. H. F. Newall obtained the "first flash" and "corona" spectra with both slit spectroscope and objective grating, those taken with the latter, however, being weak. With Mrs. Newall he also made polariscopic observations.

Mr. W. H. Wesley made an excellent drawing from his observations with the eight-inch Coudé equatorial placed at his disposal by M. Trépied, director of the French observatory at Algiers. He reports that very little structural detail was discernible in the inner corona.

The need for correction of the lunar tables is indicated by the universal experience that totality was some seconds less than that previously computed. The American observers estimate the difference as three seconds, while at Ovar, in Portugal, Mr. W. H. M. Christie, the Astronomer Royal, gives the time of totality as 85 seconds, whereas the calculated value was 93 seconds. Several observations indicate that the discrepancy is to be looked for in the moon's diameter being taken too large.

The most unfortunate victim of this error appears to have been Mr. Evershed, who journeyed to an outlying station, near Mazafran, so close to the limiting line of totality as was considered safe. He did this with the object of photographing the "flash" spectrum with as long duration as possible; this will be understood when it is considered that exactly on the central line the duration of the flash will be merely momentary, but as the observer recedes from the central line the line of sight to the moon's limb becomes more oblique, until on the limiting line of totality the so-called "flash" is visible for the whole time of totality at that point. Owing to this ambiguity of the data, the station chosen was evidently somewhat further from the central line than was anticipated, and consequently Mr. Evershed had the unpleasant experience of less than one second totality. His preparations must have been exceedingly perfect, however, for he reports having obtained a good photograph at the proper instant, though it will fall short of expectation for the reason stated.

Prof. Howe, of Denver, has already determined the position of the planet Eros, which he was fortunate enough to discover on his photographic plates during the eclipse, and has circulated his result. The co-ordinates of the planet will be found in the "Astronomical Column."
C. P. B.

NOTES.

SIR ARCHIBALD GEIKIE, F.R.S., has been elected a Foreign Honorary Member of the American Academy of Arts and Sciences in the section of Geology, Mineralogy and Physics of the Globe, in succession to the late Carl Friedrich Rammelsberg.

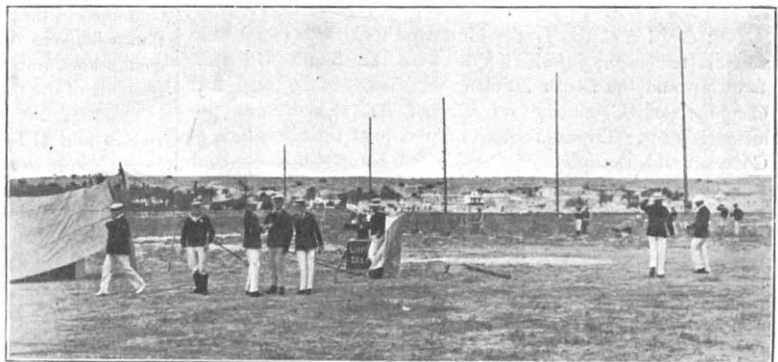


FIG. 3.—Discs on spars, for naked eye observations of the corona.

Prof. FOUQUE has been elected vice-president of the Paris Academy of Sciences for the year 1900, in succession to the late Prof. Milne-Edwards. Prof. Boltzmann has been elected to succeed the late Prof. Beltrami, in the mechanics section of the Academy.

PROF. PAUL GROTH, of Munich, has been elected a Foreign Member of the Geological Society, and Prof. A. Issel, of Genoa, a Foreign Correspondent.

THE annual conversazione of the Institution of Electrical Engineers will be held on Tuesday, June 26, at the Natural History Museum, South Kensington. The guests will be received by the president (Prof. Perry), and Mrs. Perry.

THE Croonian Lectures for 1900 will be delivered by Dr. F. W. Mott, F.R.S., before the Royal College of Physicians of London, on June 19, 21, 26 and 28. The subject is "The Degeneration of the Neurone."

It is stated that Captain W. Bade di Wismar has organised an expedition to the east coast of Spitsbergen and Franz Josef Land to seek for traces of Andrée, and also to obtain intelligence of the Duke of the Abruzzi. No apprehension is felt about the Duke of the Abruzzi, as a long interruption in his communications with the rest of the world was foreseen.

A MEETING was held at the Meteorological Society on Thursday last to consider the question of a memorial of the late Mr. G. J. Symons, F.R.S. It was resolved that the memorial should take the form of a gold medal, to be awarded from time to time by the council of the Royal Meteorological Society for distinguished work in connection with meteorological science. An executive committee was appointed to take the necessary steps to raise a fund for this purpose. Contributions will be received by the assistant secretary, Mr. W. Marriott.

LORD LISTER will open the new clinical laboratories at the Westminster Hospital on Tuesday, June 12, at 4 p.m. He will be received by Sir J. Wolfe-Barry, chairman of the committee, and supported by Lord Kelvin, Sir Michael Foster, M.P., Dr. Church, president of the Royal College of Physicians, Sir William MacCormac, president of the Royal College of Surgeons, and the Dean of Westminster.

THE completion of the twenty-fifth year of teaching by Prof. Luciani, Rector of the University of Rome, was celebrated on May 3 in the physiological laboratory of the University. The *British Medical Journal* states that the theatre was crowded with admirers of the well-known physiologist, conspicuous among whom was Prof. Baccelli. An address was delivered by Prof. Todaro, to which Prof. Luciani, who was much moved, replied. Prof. Baccelli also spoke, and ended by embracing Prof. Luciani, who was the object of enthusiastic congratulations from the assembly.

THE decision of the Trinity House authorities to remove the wireless telegraphy installation between the South Goodwin lightship and the South Foreland was discussed by the Dover Chamber of Commerce on Friday. It was decided to memorialise the Trinity Board and to request the Chambers of Commerce of the ports of the United Kingdom, as well as Lloyd's and other shipping bodies, to support the memorial, with a view to the establishment of a connection between lightships and the shore on dangerous sands.

THE president of the Board of Education has approved of a Committee, which is now sitting, "to inquire into the organisation and staff of the Geological Survey and Museum of Practical Geology; to report on the progress of the Survey since 1881; to suggest the changes in staff and arrangements necessary for bringing the Survey in its more general features to a speedy and satisfactory termination, having regard especially to its economic importance; and, further, to report on the desirability, or otherwise, of transferring the Survey to another public department." The members of the Committee are:—The Right Hon. J. L. Wharton, M.P. (chairman), Mr. Stephen E. Spring

Rice, C.B., Mr. T. H. Elliott, C.B., General Festing, C.B., Dr. H. F. Parsons, Mr. W. T. Blanford, F.R.S., and Prof. C. Lapworth, F.R.S., with Mr. A. E. Cooper as secretary.

THE announcement of the death of Miss Mary H. Kingsley, at Simonstown, on Friday, will be received with deep regret by geographers, ethnologists, and many others who are familiar with her works. Miss Kingsley was the elder of the two children of the late Dr. G. H. Kingsley, and quite recently (May 3) her memoir of her father, published with his "Notes on Sport and Travel," was noticed in these columns. Miss Kingsley will chiefly be remembered for her explorations in West Africa, and her works upon them. The first volume in which she recorded her experiences was "Travels in West Africa," published in 1897. Last year, a further volume of "West African Studies" appeared, and a few weeks ago her "Story of West Africa" was published in the Empire Series. Miss Kingsley's books are marked by a sincerity and humour which make them of deep interest even to readers who may not always agree with her forcibly-expressed convictions. Her interest in West Africa, as an obituary notice in the *Times* points out, was partly scientific, partly sociological, partly political. She made numerous contributions to our knowledge of the fishes of some of the West African rivers, and of the reptiles in that part of the continent. In both her books on West Africa she made valuable additions to our knowledge of the native mind and character, and her studies in fetish bring out in a remarkable manner the sympathetic insight which enabled her to project herself into the mind of the negro races. In "West African Studies" Miss Kingsley set forth, with much array of facts and arguments, a strong indictment of the system of government by Crown colonies in West Africa. Personally, Miss Kingsley was of a modest and retiring disposition; but the frequent journeys that she made up African rivers and through the bush with none but native attendants afforded undoubted testimony to her pluck, powers of endurance and fertility of resource.

AT the last meeting of the General Medical Council, the report of the Pharmacopœia Committee, referring to the subject of a proposed international Pharmacopœia limited to drugs of a drastic nature, was adopted. If an international conference on the subject in question is arranged, the Council will appoint representatives to participate in it, and one or more members will be appointed to act as delegates. Communications have been opened with the United States authorities with a view to bringing about greater uniformity in the official preparations contained in the British Pharmacopœia and the United States Pharmacopœia respectively; and it is hoped that, by mutual concessions, important approximations and assimilations in the contents of the two works may be ultimately secured. Further communications have been received with reference to the Indian and Colonial "Addendum," and important suggestions from Canada have been considered by the committee in detail. It is hoped that the addendum will be authorised for issue by the end of the year. By the efforts of Dr. Leech, a valuable collection of British and foreign works bearing on the history and development of the Pharmacopœia has been collected and deposited in the office of the Council.

THE widespread invasion and persistent devastations of locusts in so many parts of Africa give interest to all trials and experiments, as well as the ordinary remedies, employed for the alleviation of this ruinous plague of the farmer. The following notes from Mr. W. C. Robbins, Stock Inspector of the Lower Tugela and Mapumulo Districts, are published in the Cape official *Agricultural Journal*:—"For the past three days I have been over the ground where my men have been infecting locusts with Government fungus, and the result was that I found dead

locusts everywhere. I send you a sample; you will notice they are full of worms, and we know from experience that when locusts are found in this state whole swarms die off. Some, you will see, are half eaten; these were eaten by their fellows. I have seen many clusters of locusts eating dead ones." The feeding upon bodies of dead locusts suggests that diseased locusts may be utilised as a substitute for locust fungus. Tests are being made to determine whether a preparation from diseased dead locusts will infect a swarm in the same way as locust fungus made in the Government laboratory.

In a paper on "The Standardisation of Electrical Engineering Plant," published in the *Journal* of the Institution of Electrical Engineers, Mr. R. Percy Sellon arrives at the following general conclusions:—(a) Standardisation to a greater degree than at present exists is in the interest of the manufacturer, as a means of facilitating repetition and production, and of meeting the competition of standardising foreign manufacturers. (b) Standardisation of "ends" or "performance" as distinct from "means" or "constructional details" is equally in the interest of the user, by securing for him low purchase cost, prompt delivery, freedom from the risks of experimental designs, and full manufacturers' guarantees. (c) The relative absence of standardisation in Great Britain, in contrast with other countries, is mainly traceable to the prevailing system wherein the user's engineer specifies "means" or "constructional" details instead of confining himself to "ends" or "performance." (d) The determination of standards by organised effort rather than by the slow and costly process of "trial and error" is desirable, and should be undertaken under the auspices of the Institution of Electrical Engineers, as representing the interests of both producer and user.

If standardisation is important for the electrical engineer, it is none the less urgently needed in connection with scientific literature. Although the pages of a large number of journals and transactions, both in this country and on the Continent, are of uniform sizes, both quarto and octavo, this is by no means the universal rule; and proceedings, especially of local societies in remote districts, as well as the more popular class of scientific journals, show almost every possible variation in the dimensions of their pages. We have before us a pile of such publications, arranged in order of size, and increasing gradually from $7 \times 4\frac{1}{2}$ inches at the top to 12×10 inches at the bottom. They include many papers which it is desirable to bind up with other literature on the same subjects, but which have had to be relegated to "the pile" on account of their inconvenient sizes. This is the more unfortunate because journals of this particular character often contain reports on current research, the inclusion of which in bound volumes of reprints, easy of reference, might often save those repetitions of investigations which involve much loss of time, and only lead to disappointment, accompanied by unpleasant—not to say undignified—controversies as to priority.

THE U.S. Department of Agriculture has issued a Bulletin, No. 74, containing "Organisation Lists of the Agricultural Colleges and Experiment Stations in the United States, with a list of Agricultural Experiment Stations in Foreign Countries." Thirty-six pages are occupied by notes on the courses of study and the names of the boards of instruction at fifty-nine colleges exclusively devoted to agricultural teaching, or with agricultural departments; while twenty-one pages give the names of the governing board and staff at fifty-six experiment stations. Then follows a list of foreign experiment stations, with the names of the directors, to which is added a most useful statement of the more important publications issued in 1899 by the various stations of the United States. Some notes on the relationship of the colleges and stations to the United States

Treasury complete this exhaustive record. Probably, the information, so far as it concerns the United States, is trustworthy, but the same cannot be said in regard to the British stations, for this section of the work is defective alike as regards accuracy and completeness. It would be well to have the British section thoroughly revised in any future issue.

WE have received from Dr. W. van Bemmelen a memoir on the deviation of the magnetic needle from the end of the fifteenth century to the year 1750, with isogonic charts for the epochs 1500, and subsequent half centuries down to 1700. The work is published as a supplement to vol. xxi. of the "Batavia Meteorological and Magnetical Observations," and is the outcome of researches made during several years in various libraries and archives in the Netherlands and other European countries prior to the author's appointment to the Batavia Observatory. The work is a laborious compilation of all the most trustworthy observations, commencing with the voyage of Columbus in 1492, and is a most valuable contribution to terrestrial magnetism, containing between five and six thousand observations in all parts of the world, with references to the positions and the sources whence the information has been obtained. The value of the work is much enhanced by numerous critical remarks and by explanatory text; the language used is German.

As attention has recently been much directed to the enormous drafts that are being made on the coal supply of the world for power purposes, the following description of one of the most recent attempts to obtain power by utilising the hitherto wasted resources of nature may be of interest. A company called the Saint Lawrence Power Company, composed of English and American shareholders, some time since obtained a tract of 2000 acres of land at Massena, adjacent to the Saint Lawrence and Grasse rivers. On this land an electrical installation of considerable magnitude is in course of construction. The works, which it is expected will be completed next autumn, are intended to develop ultimately 110,000 horse-power. The plant is situated on the River Grasse, a tributary of the Saint Lawrence, from which the water for driving the machinery will be diverted through a canal three miles long, 200 feet wide at the bottom, and 25 feet deep. The bottom of this canal at the river end will be 60 feet above the ordinary water-level in the River Grasse, which will form the tail-race for the turbines. The preliminary mechanical equipment will be eight units of 5000 horse-power, each obtained by three twin turbines and dynamos. The land adjacent to the works which is to be utilised for manufacturing and allied purposes will be accessible by branches of the New York Central Railway and by the canal to the Saint Lawrence, which will be large enough to take vessels of considerable draught.

THE means of overcoming the difference of level of the country through which canals pass is in most cases overcome by locks placed either singly or in flights, depending on the height to be overcome. About twenty-five years ago, the locks between the Trent and Mersey Canal and the River Weaver, where there is a difference of 50 feet, were superseded by the hydraulic lift at Anderton. The boats here are floated into iron troughs which are raised or lowered by hydraulic power, one boat ascending and another descending at the same time. This system was subsequently adopted on other canals in France and Belgium, and, with some modifications, in Germany. What is claimed as an improvement on this system is now being carried out on the Erie Canal in America, at Lockport, by what is termed a "Pneumatic Balance Canal Lock." A description of this lift was given in a paper contributed to the Franklin Institute by Mr. Chauncey N. Dutton. The existing stone locks were erected in 1836, and overcame a lift of $62\frac{1}{2}$ feet by means of five flights. The lock which is being erected to supersede these consists of

two steel chambers, one for ascending and the other for descending boats. These chambers are divided into two parts, the upper one containing water to receive the boats, and provided with gates, as in the case of the Anderton lift; and beneath this a second chamber containing compressed air on which the lock-chamber floats. The air-chambers are so proportioned that they automatically differentiate the air-pressure. The water in the lock-chamber which contains the boat at the upper level is so adjusted that its weight, with the boat it contains, is 200 tons greater than that of the lower one. Each of these locks weighs 1500 tons and contains 4500 tons of water, the weight in motion, when the boats are ascending and descending, exceeding 12,000 tons. The advantages claimed by the use of compressed air are a saving in cost, safety in working, and great economy in water. The power for compressing the air is furnished by a 36-inch turbine working a four-cylinder pump. This also drives the dynamos which operate the gates and light the lift.

A RECENT report by Prof. Le Neve Foster upon the number of persons employed, and the number of fatal accidents, in mines and quarries in the United Kingdom, shows that in 1899 the death-rate of the workers at mines under the Coal Mines Act, taking underground and surface workers as a whole, was 1.26, whilst that of 1898 was 1.28. At the mines under the Metaliferous Mines Act, the death-rate of the underground and surface workers as a whole was 1.59, a figure decidedly higher than that of 1898, which was only .96. The inside workers in quarries had a slightly smaller death-rate from accidents in 1899 than they had in the previous year.

A RECENT consular report (No. 2418) on the trade of Corsica states that of the few industries at present carried on, that of extracting tannic acid from chestnut wood is now perhaps the most flourishing in the island. This industry is carried on in Bastia, which is the commercial centre of Corsica, by two large factories which export together about 4000 tons of extract per annum, in concentrated liquid form. To prepare this quantity requires nearly 20,000 tons of wood of the sweet chestnut tree yearly. The immense forests are equal to supplying the demand for many years; but this tree not being under the control of the Administration of Woods and Forests its wholesale destruction without compulsory replanting will, it is feared, in time not only influence adversely the climate of large districts, but cause much misery in those districts where chestnut flour forms the staple food of the peasants. It is prepared from the dried fruit of the sweet chestnut.

ACCORDING to the Acting British Consul at Samoa, rubber has been introduced there, and is being grown by several of the planters. It appears to thrive, and as far as can be seen the soil is admirably adapted for the growth of this most valuable product.

WE have received the official edition of the Fourth Annual Report of the New York Zoological Society, the substance of which is given in more popular form in a publication alluded to a short time ago in our "Notes" column.

THE Marlborough College Natural History Society, in its Report for 1899, sets an admirable example to institutions of this nature in publishing a list of the Lepidoptera of the district, the elaboration of which has been a work of years. It is by the thorough working out of local faunas that provincial natural history societies can alone properly justify their existence.

REFERRING to a remark in the review of the "Vertebrate Fauna of the Shetland Islands" in NATURE of May 24 (p. 75),

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Mr. Eagle Clarke writes to say that though he revised some of the proofs, the revision of the Cetaceans was undertaken by Mr. James Simpson, and that he did not revise either the MS. or the proof relating to that order. "Mr. Simpson, who had a special knowledge of the group, has passed from among us, but I have little doubt that his inclusion of the Narwhal in the *Physeteridae* was the result of a mere slip."

THE *Entomologist* for June contains the first instalment of the translation of an article by Prof. Max Standfuss on experiments in hybridisation, and on the influence of temperature on the development of the Lepidoptera. As an instance of the line of investigation followed, we may quote the case of the map-butterfly (*Vanessa levana*), in which the difference between insects bred from the summer and winter pupæ is so great as to have formerly led to the belief that they belonged to different species. By placing the summer pupæ in an ice-house the winter imago was produced; but, on the other hand, it was found much more difficult to change by warmth the winter pupæ into the summer imago. This led to the inference that the winter form was the original one; and this is confirmed by the circumstance that the only near relatives of this insect are four species from northern Asia.

THE second edition, revised and largely rewritten, of Dr. Julius Wiesner's work, "Die Rohstoffe des Pflanzenreiches," is in course of publication by the firm of W. Engelmann, Leipzig; and the second and third parts have just appeared. The work will be completed in two volumes, and will probably be completed towards the end of this year.

A NEW edition of Thompson's "Gardener's Assistant," which has for many years been accepted as a trustworthy repository of information on the science and art of gardening in all its branches, is in course of publication by the Gresham Publishing Company. The work has been completely revised and entirely remodelled under the direction and general editorship of Mr. William Watson, of the Royal Gardens, Kew, and contains contributions by many eminent horticulturists. The first volume has just been published.

THE first volume of a "Cyclopedia of American Horticulture"—a work described as "comprising suggestions for cultivation of horticultural crops, and descriptions of the trade species of fruits, vegetables, flowers, and ornamental plants, together with geographical data and biographical sketches," has just been published by Messrs. Macmillan and Co., Ltd. It is edited by Prof. L. H. Bailey, whose fertility in the production of excellent botanical books is really astonishing, assisted by Mr. W. Miller. The present volume extends from A to D, and contains 509 pages and 743 illustrations. The work will be completed in four volumes.

A COMPLETE and convenient cabinet of glass-blowing apparatus and materials, arranged especially for students or others using Mr. T. Bolas's book on "Glass Blowing," has been put on the market by the Camera Construction Company. Exercises in the manipulation of glass cultivate delicacy of touch and perception, and are therefore excellent as manual training for young people. In scientific work, and more especially in physical and chemical sciences, the ability to work glass is a very valuable accomplishment, and a cabinet which provides a ready means of obtaining practice in this art is a desirable possession for laboratories as well as private students.

THE question as to whether strontium and barium can replace calcium in plants has been made the subject of inquiry by more than one experimenter. The February number of the *Bulletin*

of the College of Agriculture of Tōkyō contains an interesting contribution to this question by Dr. U. Suzuki. Experiments were carried out with several species of plants and in soils containing varying amounts of calcium. The results show that strontium and barium can never replace calcium in phanerogams, as they are strongly poisonous, although the poisonous action may be lessened to a certain extent by the addition of lime salts. The *Bulletin* also contains papers by the same author on arginin, and its formation in coniferous plants; and by K. Asō, on the chemical composition of the spores of *Aspergillus Oryzae*.

AMONGST the products of the action of fluorine upon sulphur recently investigated by M. H. Moissan (see NATURE, April 19, vol. lxi. p. 597), thionyl fluoride, SOF₂, the existence of which was first indicated by M. Meslans, was noticed. MM. Moissan and Lebeau have now made this fluoride the subject of a more detailed study, and have succeeded in obtaining it in a pure state by two different methods—by the action of fluorine upon thionyl chloride, and by the interaction of fluoride of arsenic upon thionyl chloride. Thionyl chloride is a colourless gas, fuming slightly in moist air, and possessing an unpleasant odour resembling carbonyl chloride. It is easily condensed by a mixture of solid carbon dioxide and acetone, giving a liquid boiling at -32°. In the absence of moisture, glass is not attacked by the gas at temperatures below 400° C.; above this temperature silicon tetrafluoride and sulphur dioxide are produced. Water decomposes thionyl fluoride slowly at ordinary temperatures, giving hydrofluoric and sulphurous acid. Indications were obtained of another oxyfluoride of sulphur, not absorbed by water and possessing a much lower boiling point.

THE additions to the Zoological Society's Gardens during the past week include two Wild Swine (*Sus scrofa*, ♀ ♀), European, presented by the Lord Carnegie; three Chaplain Crows (*Corvus capellanus*) from Southern Persia, presented by Mr. B. T. Finch; a Herring Gull (*Larus argentatus*), European, presented by Mr. J. W. Berry; two Red Howlers (*Myiotes seniculus*, ♂ ♀) from Colombia, a Great Kangaroo (*Macropus giganteus*, ♂) from Australia, an American Flying Squirrel (*Sciuropterus volucella*), three American Box Tortoises (*Cistudo carolina*), a North American Trionyx (*Trionyx ferox*), three Changeable Tree Frogs (*Hyla versicolor*) from North America, a Black Sternotherere (*Sternothererus niger*) from West Africa, two Greek Tortoises (*Testudo graeco*), South European; six Argentine Tortoises (*Testudo argentina*) from the Argentine Republic, a Red and Yellow Macaw (*Ara chloroptera*) from South America, two Black-headed Caiques (*Caica melanocephala*) from Demerara, a Chough (*Pyrrhocorax graculus*), British, deposited; two Brown Mynahs (*Acridotheres fuscus*) from India, a Brown Mock Thrush (*Harporhynchus rufus*) from North America, an Occipital Blue Pie (*Urocissa occipitalis*) from the Western Himalayas, purchased; two Thars (*Capra jemalicus*), five Swinhoe's Pheasants (*Euplocamus swinhoii*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

PHOTOGRAPHIC OBSERVATION OF EROS.—A circular from the Centralstelle at Kiel furnishes particulars of the photograph of the planet Eros obtained by Prof. Howe, of Denver Observatory, U.S.A., during the recent total eclipse. The position determined was:—

R.A. 23h. 47m. 3'95. } 1900 May 27^h 9^m 12^s.
Decl. + 2° 46' 33" } Greenwich Mean Time.

OCCULTATION OF SATURN.—There will be an occultation of Saturn by the moon on Wednesday evening, June 13, the particulars of which are as follows:—

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	Sidereal Time. h. m.	Mean Time. h. m.	Angle from	
			North Point.	Vertex.
Disappearance ...	15 7 ...	9 40 ...	89 ...	116
Appearance ...	16 19 ...	10 52 ...	265 ...	283

The planet rises about 8.55 p.m., so that the conditions for observation will not be very favourable.

HARVARD COLLEGE OBSERVATORY.—In *Circular* No. 50 issued from the Harvard College Observatory, Prof. E. C. Pickering reviews the methods adopted in the measurement of photographic light intensities. Since 1887 all the photographs obtained at the Observatory have had the image of a standard light impressed upon them for comparison. The methods now adopted have been developed by Mr. E. S. King, under whose direction the photographs are taken at Cambridge, and his description of the plan followed occupies the greater part of the circular. All sources of light, that of the sun, moon, sky, Milky Way, aurora and stars are to be referred to one standard, given by the meridian photometer, with which Polaris has a magnitude of 2.15. The artificial standard for practical convenience is that given by an Argand burner behind a small aperture; but this is compared with Polaris every month, when a series of tests are made on a 8 × 10 in. plate, the various parts of which are then cut and stored for future inspection. These monthly comparisons in addition furnish a valuable check on the constancy of the plate and the developer used, and will, moreover, as the several parts of the divided plate are developed at different periods, furnish data concerning any change in the image dependent on the interval between exposure and development. Spectroscopic photometry is also adopted to record the photographic intensity in terms of light of a particular wavelength.

Prof. W. H. Pickering has evolved a method of reducing the standard of comparison to the actual radiation received from a certain star shining directly on the plate. This unit, however, being so small, secondary and tertiary standards have been made from it by using lenses of known aperture and focal length. Thus, with a simple plano-convex lens of 8.2 cm. aperture, the image of a Ursæ Minoris was received on a piece of ground glass placed 3 cm. from the photographic plate. The "sensitive tint" was produced after twenty minutes' exposure, and the intensity of the light was calculated to be thirty times greater than the direct radiation from the star. For lights of great intensity this secondary standard is still too small, and then recourse is had to the Argand burner constant.

LIVERPOOL OBSERVATORY.—We have received the report of Mr. W. E. Plummer, the director of the Liverpool Observatory at Bidston, Birkenhead, on the work done in the year 1899. Although the seismograph has not been in use all the year, it is intended to commence keeping a continuous record of earth movements by means of the present instrument and one to be supplied by the Earthquake Committee of the British Association. The two will be placed so as to record movements in planes at right angles to each other.

The report contains detailed results of all meteorological observations during the year, including temperature, barometric pressure, rainfall, sunshine and cloud, wind velocity, humidity, &c.; and an appendix is added containing a summary of the mean values of many of these quantities during the past thirty years.

TEMPERATURE CONTROL OF SPECTROGRAPH.—In the *Astro-Physical Journal* (vol. xi. pp. 259-261, 1900), Prof. W. W. Campbell describes the arrangement he has finally adopted for securing as complete uniformity as possible of the temperature of the various parts of the spectrograph used at the Lick Observatory for determining stellar velocities in the line of sight. The whole instrument is first enclosed in two thicknesses of thick grey blanket, the prism case having an additional two thicknesses over it. Outside the whole is then fitted a case of cedar, lined with felt, in which is embedded a length of German silver wire. This latter is heated by an electric current, the strength of which is so regulated that a thermometer placed in the prism box shows as constant reading as possible. The efficiency of the device is clearly shown by a table giving the actual variations observed during a night's work. From 8.28 p.m. to 4 a.m. the temperature of the air in the dome varied from 17°.2 C. to 19°.0 C., but the extreme readings of the thermometer in the prism box were only 18°.70 C. and 18°.84 C., so that the maximum variation was less than one-fifth of a degree.